



ICAO ENGINE nvPM EMISSIONS DATA SHEET

SUBSONIC ENGINES

ENGINE IDENTIFICATION: GE90-115B BYPASS RATIO (-): 7.1
 UNIQUE ID NUMBER: 01P21GE217 PRESSURE RATIO π_{co} (-): 42.9
 COMBUSTOR: DAC
 ENGINE TYPE: TF RATED OUTPUT F_{oo} (kN): 513.9

REGULATORY DATA

CHARACTERISTIC VALUES:	LTO_{mass}/F_{oo} (mg/kN)	LTO_{num}/F_{oo} (particles/kN)	NVPM MASS CONCENTRATION ($\mu\text{g}/\text{m}^3$)
LTO/ F_{oo} AND MAX nvPM _{mass}	32.9	5.12E+14	587
AS % OF CAEP/10 LIMIT	-	-	17.5
AS % OF CAEP/11 LIMIT (InP)	9.5	12.3	
AS % OF CAEP/11 LIMIT (NT)	15.4	18.4	

MEASURED DATA

MODE	POWER SETTING (% F_{oo})	TIME minutes	FUEL FLOW kg/s	EMISSIONS INDICES*		NVPM MASS CONCENTRATION PEAK nvPM _{mass} ($\mu\text{g}/\text{m}^3$)
				EI_{mass} (mg/kg)	EI_{num} (particles/kg)	
TAKE-OFF	100	0.7	4.600	14.9	8.94E+13	
CLIMB OUT	85	2.2	3.566	9.7	1.03E+14	
APPROACH	30	4.0	1.073	7.3	1.43E+14	
IDLE	7	26.0	0.341	5.3	1.63E+14	
LTO TOTAL (kg, mg, number of particles)			1454	12145	1.89E+17	-
NUMBER OF ENGINES				1	1	1
NUMBER OF TESTS				3	3	3
AVERAGE LTO/ F_{oo} VALUES (mg/kN, particles/kN)				23.6	3.68E+14	-
MAX EI VALUES (mg/kg, particles/kg) AND MAX MASS CONC. ($\mu\text{g}/\text{m}^3$)				14.9	1.63E+14	456

* Emissions Indices are corrected for thermophoretic loss and fuel hydrogen content

DATA FOR EMISSIONS INVENTORIES (ESTIMATIONS FOR ENGINE EXIT PLANE VALUES)

MODE	POWER SETTING (% F_{oo})	CORRECTED EMISSIONS INDICES	
		EI_{mass_SL} (mg/kg)	EI_{num_SL} (particles/kg)
TAKE-OFF	100	17.4	2.33E+14
CLIMB OUT	85	11.8	3.36E+14
APPROACH	30	9.7	6.44E+14
IDLE	7	7.6	9.25E+14

AMBIENT CONDITIONS

	From	To	FUEL	
BAROMETER (kPa)	98.0	98.3	HEAT OF COMBUSTION (MJ/kg)	43.49
TEMPERATURE (K)	295.9	298.7	HYDROGEN CONTENT (%mass)	13.65
HUMIDITY (kg water/kg dry air)	0.0063	0.0094	AROMATICS CONTENT (%vol)	16.4
			NAPHTHALENE CONTENT (%vol)	0.40
			SULPHUR CONTENT (ppm by mass)	71

MANUFACTURER: General Electric Company
 TEST ORGANIZATION: General Electric Company
 TEST LOCATION: PTO, Ohio
 TEST DATES: 25/05/2016-26/05/2016

REMARKS

1. GE Report R2019AE459/Rev. 1
2. Engine S/N 901-007